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(54) Facsimile documents bear a barcode indicating specific recipient

(57) To provide for automatic forwarding of documents transmitted by facsimile directly to intended recipients, in order to prevent unauthorised access to the document images, a prepared coding is attached to a document before the latter is transmitted from a sending location. The coding is representative of the intended recipient and can be identified by a programmed computer system operatively connected to the facsimile receiving device. The computer prevents production of the document image at the receiving device if required by the coding and makes the document image available to the intended recipient, for example by displaying the image on a visual display unit screen.

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Improvements in or Relating to Facsimile Transmission

This invention is concerned with improvements in or relating to facsimile transmission and is particularly concerned with providing for automatic forwarding of document images directly to the intended recipients in order to prevent unauthorised access to the document images.

Normally facsimile transmission is between two facsimile machines and, when a transmission is made, the document image is printed by the receiving machine before being passed to an intended recipient following human intervention. The document image inevitably therefore is accessible to other than the intended recipient, which can lead to security problems. Other problems can arise in large organisations because of the time which may elapse between the document image being produced by the receiving machine and being received by the intended recipient.

According to the present invention there is provided a method of automatically transmitting a document by facsimile from a sending location to a predetermined recipient at a receiving location other than at an initial facsimile receiving device, the method comprising the steps of providing a prepared coding on a document before transmission from the sending location, the coding being representative of the

intended recipient, transmitting the coded document, reading the coding at the receiving location during the incoming transmission, preventing production of the document image at the initial receiving device if required by the coding, and making the document image available for the intended recipient when required at other than the initial receiving device.

Preferably the prepared coding is formed by printing on a carrier sheet, the carrier sheet then being attached to the document to be transmitted. The prepared coding may be a bar code.

Preferably also the method comprises storing the document image on a computer disc and displaying, when required, the document image on a screen of a visual display unit. The method may further include encrypting the document image for storing on the computer disc, whereby the document image can be displayed only after the intended recipient is correctly identified.

The invention may also provide a method of receiving information by facsimile transmission, including the steps of transmitting a document by facsimile from a sending location to a predetermined recipient at a receiving location as described in either of the three paragraphs preceding the last paragraph, and further including

automatically transmitting information from the recipient by facsimile to the original sending location in response to a requirement identified by the coding.

The invention further provides an information carrier for use in the method as described in any of the five preceding paragraphs, the carrier comprising a sheet and information in code printed thereon and adapted to be read electronically, the sheet being arranged to be attached to a document which is to be transmitted by facsimile.

The printed information may be in the form of a bar coding, and may also include information in human readable form.

Further, the invention provides apparatus for directing a document image transmitted by facsimile to a predetermined recipient at a receiving location other than an initial facsimile receiving device, the apparatus comprising means for reading, during an incoming transmission, a coding attached to a document at the sending location before transmission, means preventing production of the document image at the initial receiving device if required by the coding, and means making the document image available for the intended recipient when required at other than the initial receiving device.

Preferably the apparatus is in the form of a programmed computer system operatively connected to the initial facsimile receiving device.

The apparatus may include means for automatically transmitting information from the recipient by facsimile to the original sending location in response to a requirement identified by the coding.

Embodiments of the present invention will now be described by way of example only.

The conventional method of transmitting documents by facsimile involves the use of a facsimile machine at a sending location and a further facsimile machine at the receiving location. A document to be transmitted is accepted by the transmitting machine and the document image is produced by the receiving machine. It is also possible to transmit by facsimile directly from a computer system via a facsimile machine, or a facsimile box which is linked to the computer system, or via a special card installed within the computer system. However, as a facsimile transmission consists of an image transmitted over a telephone line, it is not possible to reliably interpret the image in a way that can be processed by a computer system at the receiving location. The present arrangement is intended to enable a computer system to process an incoming transmission and direct same to the intended recipient remote from the facsimile receiving machine, for security and other purposes.

To enable processing by a computer system, there is provided a labelling arrangement for documents to be transmitted by facsimile. A label takes the form of a carrier sheet on which is printed a coding providing a unique identification of the intended recipient of a facsimile transmission. Such a coding is advantageously in the form of a bar code which uses a black vertical bar one unit wide to represent the binary digit 0 and a black vertical bar three times as wide to represent the binary digit 1. A combination of vertical bars, separated from each other by one unit of white space, is used to represent binary values and the number of bars used determines the maximum number of possible combinations. The combination is preceded by a lead-in vertical bar half a unit wide and of greater length than the bars of the combination, and separated from the first bar of the combination by a white space one unit wide. The combination is followed by a white space and a terminating vertical bar half a unit wide and the same length as the lead-in vertical bar. The basic unit may of course be adjusted to facilitate ease of recognition by computer routines. As well as the bar code for computer reading, each label identifies the recipient in a form suitable for human reading.

Each label is preferably formed with an adhesive backing on the carrier sheet for attachment to the document

to be transmitted. A plurality of labels may be stored on a large sheet, and adapted to be individually peeled off the large sheet for use as necessary.

The sender is required to locate an appropriate label in a correct position on one or more pages of any document to be sent by facsimile. The correct position is determined by the expectations of the receiving machine. The exact position and margins of error are defined in a computer file held on the receiving machine.

A computer system is operatively connected with a facsimile machine and has a set of computer programmes and routines which provide the facility for reading the coding on the document images of incoming facsimile transmissions. Two problems are faced by the routine provided to read the coding, i.e. finding the coding and decoding. The label incorporating the coding may for example be placed anywhere on the respective page and may not be aligned correctly horizontally or vertically so that the image presented to the routine may be rotated by anything up to $\pm 10^\circ$.

The respective page is scanned from top to bottom until a black run length of four to six pixels is located, indicating a possible position of the coding bars. Subsequent lines are scanned to see if similar run lengths

appear in similar positions. In the event that there was a possible bar on a previous line but not on the line then being scanned, the previous possible position is rejected. If there was a possible bar on previous lines and also on the line being scanned, this increases the probability of there being a valid coding position. A tolerance of one pixel is used to allow for sloping bar codes. Where more than five lines are scanned and each indicates the possibility of bars, the routine then attempts to identify the coding.

The width of the white run following the left hand bar determines the number of pixels in a bar code unit. This is approximately twice the width of the reference bar allowing for scanning discrepancies. The line is scanned to the right hand bar and white runs should be one unit wide to within a few pixels. If not the bar code cannot be evaluated. Black runs should be either one or three units wide to within a few pixels. If not the bar code cannot be evaluated. If the runs are correct and the routine reaches the right hand bar then the value of the coding is determined.

The computer identifies from the coding the correct recipient of the transmission and can store the transmission on a computer disc. By way, for example, of a visual display unit in the computer system accessible to the

correct recipient, the latter can be informed that a facsimile transmission is available for inspection so that, when required, the recipient can use the computer system to display the transmitted document image on the screen of the visual display unit. The computer system can prevent reproduction of the document image at the facsimile machine, thus avoiding unauthorised access to the document image and possible security problems.

If the coding identifies the facsimile transmission as confidential, the computer system is arranged to automatically encrypt the incoming transmission, so that the latter can only be decoded and viewed on a visual display unit by a recipient entering a correct password.

A hard copy of the facsimile transmission can of course be produced by a printer of the computer system and indeed copies can be made available on other devices which may be attached to the computer system. Also, if appropriate, reproduction of the document image can be allowed by the facsimile machine itself.

The computer system can be arranged to generate the identification labels incorporating the bar codes, and can also be arranged to generate documents for facsimile transmission complete with the bar codes thereon. Where coding

labels require to be made available to other parties for identifying documents to be subsequently transmitted by facsimile back to the computer system, sheets of both confidential and non-confidential labels can be transmitted by facsimile whereby the label sheet image may then be used to produce labels on a photocopier and may be cut up and used directly. It will be appreciated that where the computer system generates sheets of labels, the computer system itself may be programmed to arrange for facsimile transmission. It will of course be further appreciated that sheets of labels may be forwarded to other parties in any other suitable way.

In a further use, coded labels can include data identifying information which the sender requires to have transmitted by facsimile back to the sending station. Such labels extend considerably the use at present of some advanced facsimile machines which are capable of being "polled". Where a machine is set up to be polled and receives a polling code, the machine will respond by immediately sending whatever facsimile document has been stored within the machine for this purpose.

With the present arrangement, the computer system can recognise the data coding, can forward the transmission to a store and respond to the transmission by automatically

transmitting from the store, by facsimile, the required information. For example, a manufacturer or distributor can store a current price list on the computer system. Salesmen and retailers can be provided with coding labels so that these can be affixed to a document to be transmitted by facsimile to the manufacturer's facsimile machine and computer system. The latter recognises the coding label and can respond by sending the price list to the facsimile machine at the sending location. Different coding labels can request different price lists. In a further example, every page of a loose-leaf parts or maintainance catalogue can have a unique coding label printed at the top thereof. Whenever the user of the catalogue requires the latest up to date information, the page can be removed from the catalogue and transmitted by facsimile to the manufacturer's machine and computer system. The latter can recognise the coding label on the page and can respond by immediately transmitting, by facsimile, the current page to the sending location.

Various modifications may be made without departing from the invention. For example the coding system can be other than bar codes.

Whilst endeavouring in the foregoing Specification to draw attention to those features of the invention believed to be of particular importance it should be understood that

the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims:-

1. A method of automatically transmitting a document by facsimile from a sending location to a predetermined recipient at a receiving location other than at an initial facsimile receiving device, the method comprising the steps of providing a prepared coding on a document before transmission from the sending location, the coding being representative of the intended recipient, transmitting the coded document, reading the coding at the receiving location during the incoming transmission, preventing production of the document image at the initial receiving device if required by the coding, and making the document image available for the intended recipient when required at other than the initial receiving device.
2. A method according to Claim 1, wherein the prepared coding is attached to a document before transmission.
3. A method according to Claim 2, wherein the prepared coding is formed by printing on a carrier sheet, the carrier sheet then being attached to the document to be transmitted.
4. A method according to any of Claims 1 to 3,

wherein the prepared coding is a bar code.

5. A method according to any of the preceding Claims, comprising storing the document image on a computer disc and displaying, when required, the document image on a screen of a visual display unit.

6. A method according to Claim 5, including encrypting the document image for storing on the computer disc, whereby the document image can be displayed only after the intended recipient is correctly identified.

7. A method of receiving information by facsimile transmission, including a method according to any of Claims 1 to 3, and further including automatically transmitting information from the recipient by facsimile to the original sending location in response to a requirement identified by the coding.

8. An information carrier for use in the method according to any of the preceding Claims, the carrier comprising a sheet and information in code printed thereon and adapted to be read electronically, the sheet being arranged to be attached to a document which is to be transmitted by facsimile.

9. A carrier according to Claim 8, wherein the

printed information is in the form of a bar coding.

10. A carrier according to Claim 9, wherein the printed information includes information in human readable form.

11. Apparatus for directing a document image transmitted by facsimile to a predetermined recipient at a receiving location other than an initial facsimile receiving device, the apparatus comprising means for reading, during an incoming transmission, a coding provided on a document at the sending location before transmission, means preventing production of the document image at the initial receiving device if required by the coding, and means making the document image available for the intended recipient when required at other than the initial receiving device.

12. Apparatus according to Claim 11, which is in the form of a programmed computer system operatively connected to the initial facsimile receiving device.

13. Apparatus according to Claim 11 or 12, including means for automatically transmitting information from the recipient by facsimile to the original sending location in response to a requirement identified by the coding.

14. A method of automatically transmitting a document by facsimile according to Claim 1 and substantially as hereinbefore described.

15. An information carrier according to Claim 8 and substantially as hereinbefore described.

16. Apparatus for diverting a document image transmitted by facsimile to a predetermined recipient, according to Claim 11 and substantially as hereinbefore described.

17. Any novel subject matter or combination including novel subject matter disclosed in the foregoing Specification or Claims and/or shown in the drawings, whether or not within the scope of or relating to the same invention as any of the preceding Claims.